City Council Agenda Item
Staff Report

CITY OF SAN BRUNO

DATE: January 27, 2004

TO: Honorable Mayor and Members of the City Council

FROM: Scott Munns, Public Works Director

SUBJECT: Receive Status Report on Implementation of the Conversion to Chloramine for Disinfection of Water Supplies, scheduled for February 2, 2004

BACKGROUND:

This report is being furnished to the City Council as a review of the City's impending conversion of the water disinfection process from chlorination to chloramination. The introduction of chloraminated water into San Bruno homes and businesses is scheduled to occur starting on Monday, February 2, 2004.

In 1996, an amendment to the Safe Drinking Water Act (SDWA) resulted in a set of more stringent water disinfection rules that was issued by the U.S. Environmental Protection Agency (EPA) in 1998. These rules, referred to as the Disinfectants and Disinfection Byproduct Rule (D/DBR), forced many water systems to re-think their approach to disinfection systems. The San Francisco Public Utilities Commission (PUC) recognized that they would not be able to comply with the new disinfection byproduct limits, and began making plans to convert the disinfection of Hetch Hetchy water from free chlorine to chloramine.

The City of San Bruno responded initially by funding a project in the 1999-2000 Capital Improvement Program to perform a preliminary evaluation of the City's disinfection options upon the PUC's conversion to chloramine. During the 2000-2001 development of the City's Water System Master Plan Update, a thorough analysis was made of the advisability of conversion of City well water disinfection to chloramination. This study, which was included as an appendix to the Master Plan Update reviewed by the Water Ad Hoc Committee and adopted by the City Council on July 10, 2001, recommended that the City convert its disinfection system to chloramine concurrent with the PUC conversion. Specific reference to the planned chloramine conversion was also included in the July 10, 2001 staff report that accompanied the recommendation for adoption of the Master Plan Update. The technical study has been included as Attachment 3 to this staff report.

The chloramine conversion project was first noted in the adopted operating budget for the Water Division in 2001 (p. 16 of the 2001-03 Enterprise Funds Budget), and then again in 2003 (p. 17 of the 2003-05 Enterprise Funds Budget). Over the past three years, San Bruno staff has been involved in a series of 14 workshops that have been developed by the PUC operations staff. These have been extremely valuable for all agencies that use PUC water to understand the project, coordinate their own operations with the project, and participate in a massive public outreach program. The most recent workshop was held on November 13, 2003, and dealt with the hour-by-hour plan for the impending conversion process and a summary of the final media blitz scheduled to begin on January 19, 2004.

In addition, the Water Ad Hoc Committee, at its meeting on January 24, 2003, reviewed the necessity for chloramine conversion and the staff's planned approach to public information, prior to the commencement of the City's intensified public outreach campaign. In San Bruno, public outreach on chloramination actually began in July 2001, when information on the planned conversion was first included in the Consumer Confidence Report, an annual report on water quality issues that is mailed directly to every water customer in San Bruno. The majority of the City's public outreach efforts to inform the public about this important change to our water have occurred over the past 12 months. A chronology of this outreach effort is included as Attachment 1, and includes some of the regional outreach efforts made by the PUC.

The Water Division staff has been busy over the past year preparing existing facilities and installing new facilities to accommodate the new disinfection system. These improvements include new chemical injection feed systems, an upgraded analyzer and monitoring network at wellheads, tanks, and other critical points in the distribution system, and automatic flushing stations. Staff has also undergone training to operate these new systems, and a final training session will be performed as the systems come on line.

DISCUSSION:

Health Issues

As noted in our first major mailing to residents regarding chloramination (a copy is included as Attachment 2 to this report), disinfection of public water supplies was one of the major public health advances of the last century, keeping the nation's drinking water supplies safe from many waterborne illnesses. While disinfection of drinking water supplies in San Bruno and many other communities has traditionally been accomplished by the addition of free chlorine, recent scientific discoveries have established that chlorine reacts with naturally occurring organic substances in water to produce byproducts that can potentially harm human health. It is for this reason that the EPA has issued progressively more stringent rules on disinfection. In order to comply with the EPA's Disinfection Byproducts Rules, the PUC has determined that the Hetch Hetchy system must move away from free chlorine in favor of a less reactive and longer-lasting disinfectant, chloramine.

The different chemical composition of chloraminated water means that such water should not be introduced directly into the blood stream of living animals (as can occur through the gills of fish or through a kidney dialysis process in humans). Because of this fact, and the knowledge that chlorine can produce potentially harmful by-products, many people may wonder whether the alternative of chloramine also has the potential to be harmful to human or animal health. The answer, for all practical purposes, is "NO". At the Water Ad Hoc Committee meeting of January 24, 2003, public health educator and water disinfection expert Charlotte Smith reviewed the science behind chloramine disinfection with the Committee and staff. She noted studies, conducted by the Environmental Protection Agency, which established no public health justification for the regulation of chloramine byproducts. Ms. Smith subsequently reviewed and approved our public education materials before they were mailed to San Bruno residents.

The use of chloramines for disinfection of water supplies is a process that has been around in the United States since 1916. This disinfection process is currently in use in several major Bay Area water systems (Alameda County Water District, East Bay MUD, and the Santa Clara Valley Water District), and is in use throughout most of Southern California.

Technical Issues

When faced with the prospect that PUC water (which constitutes approximately 50 percent of San Bruno's water supply on an annual basis) was going to be converted to this new disinfection process, San Bruno had to decide whether to also convert our local well water sources to this new process. While it is technically feasible to operate some water systems in which water sources treated with free chlorine and chloramine are blended, this process must be carefully and constantly regulated in order to prevent the breakdown of both disinfectants and the formation of disinfection byproducts. The physical structure of San Bruno's water system presented impediments to being able to maintain the necessary constant positive control over the mixing of our two water sources. Our two different sources of water are introduced into San Bruno's distribution system at several different locations, involving four groundwater wells and four metered connections to the PUC. This differs significantly from the introduction and control of blended water supplies that would be possible at a single central treatment plant, as is common in the systems of many jurisdictions. Further, the blend of the two types of water that a consumer may receive will vary from hour-to-hour, day-to-night, and winter-to-summer. Increasing the City's quantity of locally produced well water would not have solved this problem, since the condition of not having positive control over the blending of the two water supply sources within our system would still exist.

Due to these issues, City staff and consultants retained by the City believed that the safety of the public water supply in San Bruno would best be protected by delivering one, homogeneous type of water to our customers. The choices then become 1) conversion of our well water disinfection to chloramine, or 2) "re-treatment" of water purchased from the PUC back to free chlorine. The re-treatment of PUC water would require that a massive ($ millions) additional capital investment be made in San Bruno's water system, involving the rerouting and re-plumbing of portions of our existing water distribution system and the construction of additional treatment facilities. It would also have resulted in the supply of a different type of water than that of all of our neighboring agencies with which San Bruno has emergency water inter-ties. As a result, it was concluded that there were no economically viable alternatives to overcome these impediments while still protecting the public health, and the recommendation to convert our well water disinfection method to chloramines was retained as part of the Water System Master Plan Update presented to the City Council for consideration, which was adopted in July 2001.

The major concern with a water system disinfected using chloramine is the potential for nitrification. This occurs when chloramines break down to release ammonia into the water system, and that ammonia is oxidized by bacteria that produce nitrite and nitrate. Although these products are not generally harmful to health, they can lead to a drop in residual chlorine, cloudy water and complaints about taste. To avoid the potential for nitrification in our system, San Bruno engaged the services of noted water system engineer Koby Cohen as a consultant. Mr. Cohen used a program developed by the American Water Works Research Foundation to model San Bruno's water system and identify needed modifications, and helped the City develop nitrification monitoring and prevention programs. These modifications and programs are now in place, and staff is confident in our ability to complete the conversion successfully.

Next Steps

At 12:00 AM on February 2, 2004, the conversion will begin at the primary PUC treatment facility in the Central Valley. Approximately 24 hours later, the conversion will begin to occur in San Bruno's water supply. The progression of the chloramine-treated water throughout the City's water system will be monitored using both our SCADA monitoring system and supplemental manual testing.

The Water Division has planned a staged approach to the conversion. In the first phase, as the PUC system is converting and begins to deliver converted PUC water throughout the City's distribution system, we will shut down the City's wells and obtain 100% of the City's water supplies from the PUC. This phase will also include the planned draw down and refilling of San Bruno's water tanks in order to accelerate the changeover of the water. After approximately one week, once we are satisfied that the PUC conversion process is complete and has been stabilized, phase two of the process will involve bringing the City's wells back on line one at a time, using our own wellhead chloramine treatment facilities. The entire process is expected to take approximately two to four weeks before our operations are back to full well production.

FISCAL IMPACT:

There is no fiscal impact at this time, as this item is informational in nature. The City has previously budgeted an aggregate of $525,000 for the conversion project. Of that, $318,000 is allocated for current upgrades, improvements, public outreach, and consultants. The remaining $207,000 is available for further system modifications, if such improvements are deemed necessary after initial implementation.

ALTERNATIVES:

None. The project alternatives that were considered previously were noted in the "DISCUSSION" section above.

ENVIRONMENTAL STATUS:

The PUC conversion to chloramine was the subject of an environmental impact report (EIR), which addressed the system-wide environmental factors. The specific work performed by the City to implement chloramination locally is categorically exempt as a minor modification to an existing facility.

RECOMMENDATION:

Staff recommends that the City Council receive and consider this Status Report on Implementation of the Conversion to Chloramine for Disinfection of Water Supplies, scheduled for February 2, 2004.

ATTACHMENTS:

1. Chronology of Public Outreach on Chloramine Conversion
2. Eight-page, four-color mailing on chloramine conversion distributed to all postal customers in San Bruno
3. Appendix C "Disinfection" to July 2001 Water System Master Plan Update

DATE PREPARED: January 16, 2004

REVIEWED BY:

_____ CM
_____ ACM
_____ FD, Other

Attachment 1
Public Outreach on Chloramine Conversion

July 2001—Chloramine Conversion noted in annual Consumer Confidence Report (CCR) for 2000, distributed to all postal customers in San Bruno

July 2002—Chloramine Conversion noted in annual CCR for 2001, distributed to all postal customers in San Bruno

January 2003—San Francisco PUC conducts press conference, releases info to media

February 2003—New website devoted exclusively to chloramine conversion (www.sanbrunowater.ca.gov) goes live; City telephone number (650-616-7068) dedicated as "chloramine hotline"

February 27, 2003—Eight-page, four-color mailing on chloramine conversion distributed to all postal customers in San Bruno (see Attachment 2 for copy)

May 21, 2003—Twelve-page, two-color booklet on chloramine's effects on fish distributed to local pet stores, along with introductory letter and point-of-purchase display

May 27, 2003—Letter mailed to restaurants and seafood companies about chloramine's effects on live fish tanks

July 2003—Annual CCR for 2002, distributed to all postal customers in San Bruno, features three pages (in color) on chloramine conversion

July-August 2003—Chloramine conversion featured on rate increase notices included in all customer water bills

September 2003—One page insert on chloramine's effects on business and industry included in Chamber of Commerce newsletter

September 2003—Q&A section about chloramine conversion included in City newsletter ("Focus"), distributed to all postal customers in San Bruno

December 2003-January 2004—Utility bill insert on chloramine conversion included in all customer utility bills

December 2003—Text notice about chloramine conversion included on City's local access cable channel

January 13-31, 2004—Broadcast-quality commercial spot on chloramine conversion slated to run as "insert" throughout City's cable system

January 19, 2004—SFPUC begins a final media blitz including local and regional coverage in television, radio, and print media

January 27, 2004—Update on chloramine project scheduled for City Council meeting, broadcast live on local access cable channel

Continuous—Copies of the chloramine mailing and the fish brochure have been on display at City Hall and the Public Library continuously since their release to the public.